Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules with	)	GN Docket No. 12-354
Regard to Commercial Operations in the 3550-	)	
3650 MHz Band	)	

To: The Commission

REPLY COMMENTS OF
Open Technology Institute at the New America Foundation
Consumer Federation of America
Public Knowledge
Free Press

Michael Calabrese
Sean Vitka
Wireless Future Project/Open Technology Institute
New America Foundation
1899 L Street, NW – 4th Floor
Washington, DC 20036

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Table of Contents

The undersigned groups, members of the Public Interest Spectrum Coalition (hereinafter "PISC"), are pleased to submit these Reply Comments in response to the Commission's Notice of Proposed Rulemaking and Order ("*NPRM*") adopted in the above-captioned proceeding.[1]

I. INTRODUCTION AND SUMMARY

PISC strongly supports the Commission's effort to convert this very substantial but grossly underutilized swath of spectrum into an intensively-used small cell band in a manner that not only protects military and other incumbent systems from interference, but also builds a foundation for more extensive private sector sharing of underutilized bands with an automated governing mechanism (a "Spectrum Access System"). The Commission's three-tier access system strikes the right balance, we believe, between protecting incumbent operations and facilitating private sector usage on a spectrally-efficient, small cell basis. The Commission's *NPRM* is a critical first step in a long-term effort to reorient the nation's spectrum policy toward *use* rather than exclusively reserved *non-use* of capacity on the public's infinitely-renewable spectrum resource. As we noted in our initial comments, the proposed Citizens' Broadband Service and refinement of a Spectrum Access System is potentially a landmark in the Commission's progress away from static 'command and control' licensing rules and toward more flexible and spectrum-efficient approaches that begin to harness the full potential of the nation's spectrum resources.

PISC strongly believes that however the Commission defines eligibility for Priority Access, it is vital that it establish a forward-looking, three-tier framework that ensures a robust degree of opportunistic access (General Authorized Access) on a nationwide basis. A substantial portion of the band should always be available for General Authorized Access ("GAA") in every

[1] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, GN Docket No. 12-354 (rel. Dec. 12, 2012) (hereinafter "NPRM").

market. In addition, GAA users should be able to opportunistically access unused spectrum capacity in the band across the entire 150 MHz, subject to protecting Federal incumbents and secondary Priority Access licensees.

Finally, PISC supplements its initial comments by outlining additional reasons why the sort of two-tier, exclusively-licensed version of the Spectrum Access System (SAS) proposed in comments filed by Qualcomm and Nokia is both unnecessary and counterproductive relative to the public interest purposes of this small cell band. What Qualcomm and Nokia call an "Authorized Shared Access" licensee (ASA) is functionally identical to the Spectrum Access System proposed by PCAST and by the Commission in the *NPRM*, except for two major differences that, at least for this band, make it vastly inferior to the Commission's proposal to permit open registration of any eligible Priority Access use and to include an underlay of General Authorized Access on an opportunistic basis. While the *NPRM* proposes separating the band management function from control of the spectrum, thereby expanding on the concept of the TV Bands Databases as privately-operated but neutral traffic regulators, the winning bidder(s) in the auction for exclusive ASA licenses would dictate the scope, terms and price of entry to the band, as well as its potential use. As the 'owner' of the spectrum, the ASA licensee has a strong incentive to extract rents, not maximize overall use of the band.

This proceeding is foundational. As the President's Council of Advisers on Science and Technology ("PCAST") concluded, by improving on the concept of the commercially operated TV Bands Databases, the Spectrum Access System(s) certified to facilitate shared use of the 3550-3700 MHz band can be the platform and infrastructure for a spectrum "superhighway" of private sector sharing of underutilized federal bands. PISC urges the Commission to keep this larger policy goal in mind as it determines the best balance between opportunistic and exclusive

licensing – and the type of spectrum access management system that will serve the broader public interest in the long term as both necessity and technology push toward more intensive band sharing, particularly with federal operations on underutilized bands.

II. THE COMMENTS EVIDENCE WIDESPREAD SUPPORT FOR A THREE-TIER FRAMEWORK THAT ENABLES NON-EXCLUSIVE OPPORTUNISTIC ACCESS ACROSS THE ENTIRE BAND

The Public Interest Spectrum Coalition agrees that the *NPRM*'s three-tier proposal strikes the right balance between protecting Federal operations and encouraging intensive use of the band for a wide variety of innovations and services. PISC's comments numbered among the many that agreed with the conclusion reached in the *NPRM*:

> We believe that for the 3.5 GHz Band to be used efficiently, we must authorize opportunistic uses beyond the Priority Access tier described above. Under our proposal, GAA devices could be used for a variety of residential, business, and enterprise purposes to offset capacity shortages and extend wireless coverage to currently unserved and underserved areas.[2]

As Microsoft correctly observes, "[t]he *NPRM*'s three-tier proposal, which includes GAA in its proposed tiers, ensures that incumbent and critical-needs users will not experience interference, and that the public, including mobile operators, can opportunistically use this spectrum for a variety of wireless applications."[3] As AT&T states in its comments, "designating the GAA tier for unlicensed Part 15 use will foster innovation in mass-market technologies, devices, and services for use in various residential, business, and enterprise scenarios, while ensuring that such devices do not interfere with the primary and secondary licensees."[4]

Although the comments suggest a wide range of opinion concerning eligibility and use of the band on a Priority Access basis, most notably on the question of indoor-only versus wider-area licensing, support for a robust General Authorized Access tier came from a diverse range of

[2] *NPRM* ¶ 75.
[3] Comments of Microsoft Corporation, GN Docket No. 12-354 (Feb. 20, 2013) at 8 ("Comments of Microsoft").
[4] Comments of AT&T, GN Docket No. 12-354 (Feb. 20, 2013) at 10 ("Comments of AT&T").

parties.[5] In particular, PISC strongly agrees with Google's assertion that the Commission should "establish rules under which the SAS would reserve some spectrum specifically for GAA operations as necessary to ensure that GAA devices can operate even in geographic areas where demand for secondary exclusive spectrum is high."[6] Likewise, the Wireless Internet Service Providers Association (WISPA) supports the *NPRM*'s proposed framework where "GAA would include the entire 150 megahertz of spectrum between 3550-3700 MHz, subject to [protecting] the Incumbent Access and Priority Access tiers."[7]

PISC strongly believes that however the Commission defines eligibility for Priority Access, it is vital that it establish a forward-looking, three-tier framework that ensures a robust degree of opportunistic access (GAA) on a nationwide basis. A substantial portion of the band should always be accessible for GAA use in every market. In addition, GAA users should be able to opportunistically access unused spectrum capacity in the band across the entire 150 MHz, subject to protecting Federal incumbents and secondary Priority Access licensees. As noted above, the Commission's three-tier sharing framework would reorient the nation's spectrum policy toward *use* rather than exclusively reserved *non-use* of capacity on the bands where incumbent federal operations cannot be cleared for reallocation to exclusive licensing, or at least not for the foreseeable future. It will also establish an automated enforcement mechanism

[5] *See, e.g.*, Comments of AT&T at 10; Comments of the Consumer Electronics Association, GN Docket No. 12-354 (Feb. 20, 2013) at 5; Comments of Google Inc., GN Docket No. 12-354 (Feb. 20, 2013) at 7 ("Comments of Google"); Comments of Microsoft at 8; Comments of Motorola Solutions, Inc., GN Docket No. 12-354 (Feb. 20, 2013) at 2 ("Comments of Motorola Solutions") ("MSI supports the three general tiers of access outlined in the Notice"); Comments of the National Cable & Telecommunications Association, GN Docket No. 12-354 (Feb. 20, 2013) at 4 (also proposing that cable operators be able to register small cell Wi-Fi hotspots in the Priority Access tier); Comments of Spectrum Bridge, Inc., GN Docket No. 12-354 (Feb. 20, 2013) at 6 ("Comments of Spectrum Bridge"); Comments of the WhiteSpace Alliance, GN Docket No. 12-354 (Feb. 17, 2013) at 2; Comments of the Wireless Internet Service Providers Association, GN Docket No. 12-354 (Feb. 20, 2013) at 14 ("Comments of WISPA"); Comments of the Utilities Telecom Council, the Edison Electric Institute and the National Rural Electric Cooperative Association, GN Docket No. 12-354 (Feb. 20, 2013) at 5 ("the Associations believe that the 100 MHz should be divided between Priority Access and GAA . . .").

[6] Comments of Google at 7.

[7] Comments of WISPA at 15.

capable of both protecting incumbent systems *and* facilitating the greatest possible use and innovation by innovators and individuals alike.

Although PISC does not believe that the utility of small cell GAA across the 3550-3700 MHz band is limited to offloading traffic from mobile broadband devices, even for that purpose it should be clear from trends in Wi-Fi offload that both consumers and even the wireless industry (overall) would benefit if every individual consumer, business and public space had the option to incorporate this additional bandwidth into a small cell network established by the end user at the very edge of the network. Since Wi-Fi is small cell by definition, one of the proven benefits is that it facilitates spectrum frequency re-use over very small areas (a home, business, or school). Because of its efficiency and low cost, unlicensed spectrum will soon carry more data traffic than either wired lines or licensed carrier bands. Cisco's widely-cited Visual Networking Index (VNI), which projects growth in mobile data demand, concluded in its forecast last June 1 that Wi-Fi devices will consume 37.2 exabytes of data worldwide per month in 2015, carrying more than six times as much total data traffic over the airwaves as commercial mobile networks (with 6.3 exabytes per month).[8]

Small cell offloading over Wi-Fi has been shouldering an increasing share of the capacity load on often under-provisioned licensed wireless networks. Since most video and other high-bandwidth applications on mobile devices are used indoors and within range of a wired local area network, widespread availability of unlicensed spectrum is the single most important factor in mitigating the supposed "spectrum crunch." More than half of the page views on Apple iPhones come through a Wi-Fi network, as does 92% of iPad web browsing, according to

[8] Cisco Visual Networking Index: Forecast and Methodology 2010-2015, June 1, 2011; *available at* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf.

Nielsen research.[9] Cisco's Internet Business Solutions Group (IBSG) found in a 2011 study that only 35 percent of mobile data use was "on the move" (truly mobile), while the remainder was nomadic – either at home (40%) or in the workplace (25%)."[10] The Cisco study shows that "80 percent of the time, people connect to the mobile Internet from their home, office, or other indoor location – all areas that are sufficiently addressed by Wi-Fi."[11]

Of course, the ability to access sufficient amounts of unlicensed spectrum – in homes, businesses, in rapidly proliferating public hot spots and across hot zones – is a complement and cost saving to both commercial wireless carriers and to wireline ISPs seeking to give their customers the ability to access content away from their wired connections at home. A study by Juniper Research projects that 63% of the data traffic generated by smartphones, tablets and feature phones will be transferred onto the fixed network via Wi-Fi and femtocells by 2015.[12] This is already translating into huge cost savings for consumers and carriers alike. The Cisco IBSG study suggested that, "mobile operators can reduce their radio access costs by at least 25 percent (in most cases) by selectively incorporating Wi-Fi into their network architectures and operations."[13] In a 2012 study for the Consumer Federation of America, economist Mark Cooper estimated that by 2010 carriers had avoided building 130,000 new cell sites due to Wi-Fi offloading, "lowering the cost of cellular broadband service substantially, with savings on the order of $20 billion per year, which is a substantial savings in a market with annual revenues of

[9] Kevin C. Tofel, "iPhones, iPads thrive on Wi-Fi, Androids on 3G and 4G," GigaOm, June 23, 2011, *available at* http://gigaom.com/mobile/iphones-ipads-thrive-on-wi-fi-androids-on-3g-and-4g/.
[10] Cisco, *Visual Networking Index: Forecast and Methodology* 2010-2015, June 2011 at 10, available http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html.
[11] *Connected Life Market Watch*, Cisco IBSG, at 5 (2011).
[12] Juniper Research, "Relief Ahead for Mobile Data Networks as 63% of Traffic to Move Onto Fixed Networks via Wi-Fi and Femtocells by 2015," April 19, 2011; *available at* http://www.marketwire.com/press-release/relief-ahead-mobile-data-networks-as-63-traffic-move-onto-fixed-networks-via-Wi-Fi-femtocells-1503808.htm
[13] *New Chapter for Mobile*, Cisco IBSG, at 5 (2011).

$70 billion."[14] Cooper also values the explosive growth in the number of Wi-Fi hotspots available, estimating the value of hot spot connectivity to be an "extremely conservative… $10 billion per year and growing."[15]

More broadly, the unlicensed economy has become central to the positive impact of both wireless and wired Internet access on innovation, job creation and economic growth more broadly. The most obvious benefit of unlicensed spectrum has been Wi-Fi networks that permit many different users – at home, at work, in a coffee shop or other "hot spot" – to share the same wired Internet connection. Because Wi-Fi operates at very low power and is open to all users, there can be many homes, employees, or customers of a retail establishment sharing the same 2.4 GHz band in a relatively small area with little or no interference. Unlicensed Wi-Fi routers, chips and services are a rapidly-growing, multi-billion-dollar industry, but more important for the economy, for education and for other purposes, is the tremendous *multiplier effect* that Wi-Fi has on the use and utility of the Internet by making a single wired connection available for shared use on a very low-cost, do-it-yourself basis. This generates enormous consumer welfare that could be extended and enhanced by another substantial band open to opportunistic access nationwide.

[14] Comments of Consumer Federation of America, *In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, FCC 12-118, Docket No. 12-268 (Jan. 25, 2012), at 2, updating key findings from its previously published study on the economics of Wi-Fi offloading. *See* Mark Cooper, *Efficiency Gains and Consumer Benefits of Unlicensed Access to the Public Airwaves: The Dramatic Success of Combining Market Principles and Shared Access*, Consumer Federation of America (Jan. 2012).

[15] *See* Cooper, *id.*, at 19

III. A TWO-TIER AND EXCLUSIVELY-LICENSED 'AUTHORIZED SHARED ACCESS' MODEL IS AN UNNECESSARY AND COUNTERPRODUCTIVE CONSTRAINT ON THE WIDESPREAD USE AND INNOVATION POTENTIAL OF A CITIZENS BROADBAND SERVICE

Although a very diverse and far greater number of comments concurred with the Commission's proposed three-tier framework for sharing the 3550-3700 MHz band, several substantial comments recommended an exclusively-licensed two-tier approach to govern use of the band. T-Mobile advances this preference in a straightforward manner, proposing that the Commission should conduct an auction to "assign at least 50 MHz of the 3.5 GHz band spectrum on an exclusive licensed basis."[16] Alternatively, Qualcomm and Nokia Siemens filed very similar comments proposing a two-tier framework based on what they call "Authorized Shared Access" (ASA), which Qualcomm describes as "a licensed regulatory framework that can offer mobile operators and their subscribers exclusive access to this underutilized band where and when U.S. government incumbents are not using it."[17] It is not clear if Qualcomm and Nokia diverge from T-Mobile – and would have the Commission auction the spectrum subject to a mandate that the licensee operate a proprietary version of the *NPRM*'s proposed SAS (which Qualcomm and Nokia re-label "Authorized Shared Access") that would be open to at least some selected third party operators. PISC assumes this is the case for the purpose of these comments, which focus on why the Commission's proposed three-tier access system promotes the broader public interest to a greater degree.

In our initial comments, PISC described four reasons why the Qualcomm/Nokia two-tier model is inferior to the Commission's proposal to permit open registration of any eligible Priority Access use and to include an underlay of General Authorized Access on an opportunistic

[16] Comments of T-Mobile USA, Inc., GN Docket No. 12-354 (Feb. 20, 2013) at 8 ("Comments of T-Mobile").
[17] Comments of Qualcomm Incorporated, GN Docket No. 12-354 (Feb. 20, 2013), at I ("Comments of Qualcomm"). *Accord*, Comments of Nokia Siemens Networks US LLC, GN Docket No. 12-354 (Feb. 20, 2013) at 20-21 ("Comments of Nokia").

basis.[18] We won't repeat those arguments here, but we note that in its comments, Microsoft similarly observed that the two-tier ASA licensing model would impose an enormous opportunity loss on society compared to the more open and flexible three-tier model proposed by the *NPRM*. Microsoft argues:

> The two-tier proposal should be rejected since it would deprive the public entirely of the tremendous innovation and entrepreneurship that will be unleashed by creating a genuine *Citizens* Broadband Service. The two-tier proposal would take this underutilized band and wall it off from most of the Nation's business and residential users who could not take advantage of small cells in this new band.[19]

In their comments, Qualcomm and Nokia argue that a two-tier framework controlled by an exclusive ASA licensee is necessary "in order to support the delivery of a reliable and predictable quality of service while guaranteeing interference-free spectrum sharing between incumbent systems and the ASA rights holders' networks."[20] Although ensuring quality of service among "priority access" uses of the band is certainly a legitimate policy goal, neither Qualcomm nor Nokia give any reason why this could not be done (a) with equal (and likely greater) effectiveness by a single or competing commercial SAS administrator(s) authorized by the Commission, just as it is by authorized and competing TV Bands Database administrators; and (b) without excluding opportunistic access (GAA) to unused capacity. Both companies' comments describe an "ASA" framework that is identical in functionality to the SAS proposed by the NPRM and, previously, by PCAST. The sole difference is its purpose, which for the ASA licensee would apparently be the very narrow and geographically limited one of leasing small cell capacity to mobile carriers in (primarily) congested urban markets. If the Commission determines that it wants to allocate a portion of the band for Priority Access on wider-area,

[18] Comments of Open Technology Institute at the New America Foundation, Consumer Federation of America, Public Knowledge, Free Press, GN Docket No. 12-354 (Feb. 20, 2013) at 31-33 ("Comments of PISC").
[19] Comments of Microsoft at 9.
[20] Comments of Qualcomm at iv.

exclusively licensed basis (as Google, among others, propose), this can be incorporated into the more general and neutrally-managed platform of the SAS. There is no need to either tie the control of the spectrum to the SAS, or to preclude an opportunistic underlay of GAA across the entire band – particularly when that inevitably creates a rent-seeking monopoly ASA licensee that has every incentive to create scarcity rather than to facilitate abundance.

It is clear from Qualcomm's comments that what it calls "Authorized Shared Access" is functionally identical to the SAS proposed in the *NPRM*, but with two essential differences: First, instead of separating the band management function from ownership and control of the spectrum, as the Commission proposes with the SAS (expanding on the concept of the TV Bands Database as a privately-operated but neutral traffic regulator), the winning bidder(s) at the ASA auction would presumably dictate the scope, terms and price of entry to the band, as well as its potential use. As the 'owner' of the spectrum, the ASA licensee has a strong incentive to extract rents, not to maximize overall use of the band. The ASA licensee would deal primarily, if not exclusively, with high-volume wholesale purchasers with low transaction costs (such as national carriers in urban centers). This business model for ASA is evident in the opening sentence of Qualcomm's comments, which state that ASA "***can offer mobile operators and their subscribers exclusive access*** to this underutilized band."[21] A wide range of innovative but small scale users and uses including, most likely, the "mission critical" institutional users the Commission's proposal aimed at accommodating, could be shut out of what would become a proprietary band.

This ASA approach would have major implications for wireless market competition as well. For example, without significant conditions on the ASA licensee's business model, it could

[21] Comments of Qualcomm at *i* (emphasis added). Qualcomm asserts that "mobile broadband network operators are increasingly constrained by the difficulties involved in gaining access to the additional spectrum needed to support end users' skyrocketing data demands while providing a consistent quality of service." *Id.* at 5.

enter into a proprietary offload deal with a single national carrier that could thereby preclude use of the spectrum by the vast majority of the population, even in their own homes, who are subscribers of competing (and likely smaller) carriers. The foreclosure value of a deal with the ASA licensee would be so high, that we'd expect one of the two dominant national carriers to lock the band up in at least the 10 or 20 largest metro markets. Although the Commission could in theory impose extensive "common carrier" obligations on the ASA monopolist – and seek to replicate many of the benefits of an open and neutral SAS – the transaction costs of a heavy-handed regulatory approach would be higher and overall usage far lower.

A second difference between the Commission's three-tier framework and the two-tier ASA described by Qualcomm and Nokia is that there would be no opportunistic access to unused capacity open to any individual consumer, innovator, or business seeking it. This would represent an enormous waste of unused spectrum capacity, particularly in non-congested areas (i.e., in most of the country), that seems indefensible considering that the SAS proposed in the *NPRM* could enable GAA spectrum use while protecting both Incumbent Access and Priority Access uses (however defined) from harmful interference. Spectrum would be warehoused in order to justify higher rents charged to the ASA licensee's wholesale customers. And absent common carrier and pricing conditions on the ASA license, the mom-and-pop WISPs that offer the only real broadband service in the most underserved rural and remote areas of the country could be priced out of the market, or pitted against eachother to bid on bandwidth the Commission could be making available via a Citizens' Broadband Service.

Excluding GAA would represent an enormous opportunity loss. As PISC detailed in its initial comments, and in the section above, the evidence from trends in Wi-Fi offloading alone – nearly all of which is effectuated by very small cell "hotspots" established by end users at the

edge of the network (individuals, businesses, public spaces) and by non-carrier hotspot providers (e.g., cable metronets) – suggest that intensive spectrum re-use is most effectively deployed by very small cells within or around spaces controlled by consumers. Mobile device data traffic carried over Wi-Fi deployed by end users dwarfs the traffic offloaded by femtocells or other carrier-deployed small cell strategies, in part because of universal standardization and the appeal of end-user control. And while carrier offload may seem the most obvious use of the 3.5 GHz band today, innovations in machine-to-machine (M2M) and other unimagined services may be more important in the years to come. The greatest value of another small cell band for consumers, ISPs of all kinds (mobile, cable, WISPs), and for innovation in adjacent markets (chips, devices, apps, and services) will be the widespread adoption of a GAA standard at the network's edge – not the proprietary and wholesale carrier offload service that the ASA monopolist negotiates with today's leading CMRS carriers.

There is one further irony associated with Qualcomm's premise that an exclusive ASA licensee is necessary to manage a quality of service offering "for mobile operators and their subscribers:"[22] the major carriers don't appear interested in this spectrum for that purpose (unless, as T-Mobile's comments suggest, they can acquire an exclusive license for themselves). AT&T's comments state that "[t]his spectrum has limited value for traditional CMRS and mobile broadband transmissions, but possesses propagation characteristics and other attributes that make it a potentially valuable test-bed for small cell deployments."[23] Specifically, AT&T explains that "the Band's signal propagation characteristics and the presence of incumbent users," render it less valuable for mobile operators, [24] and that due to exclusion zones to protect incumbent users

[22] Comments of Qualcomm at 2.
[23] Comments of AT&T at i.
[24] Comments of AT&T at 5 (footnotes omitted).

"there are many areas of the country where only slivers of spectrum would be available for non-incumbent use."[25]

When the Commission requested comments on the utility of the 3550-3650 MHz band in 2011, other carriers and carrier groups also took time to specifically dismiss the 3.5 GHz band's usefulness for mobile carriers. In its comments in the current proceeding, AT&T quotes from its filing in 2011, reiterating that the 3.5 GHz band is "likely to be of limited utility for mobile broadband[,]" but "might prove quite useful for fixed broadband or for unlicensed use."[26] Although at the time of the 2011 filings, NTIA had identified the band for potential reallocation for high-power CMRS use, necessitating very large coastal exclusion zones, the carrier comments on the suitability of the band for quality of service mobile offerings referred equally to the 3.5 GHz band's unsuitable propagation characteristics. CTIA wrote that the band was "unlikely to be useful for mobile services due to propagation issues in the near-term . . .,"[27] while T-Mobile stated that the "spectral location of the 3550-3650 MHz" band, among others, "make them less suitable for mobile broadband applications."[28] Motorola Solutions agreed, arguing that the "propagation characteristics of this relatively high frequency spectrum make the band less ideal for exclusively licensed mobile use than some lower frequency spectrum, particularly outside of densely populated urban environments."[29] 4G Americas filed comments stating that "4G Americas does not support including the 3550-3650 MHz band towards the goal of making

[25] *Id*. at 5 n.15.
[26] Comments of AT&T at 3, quoting Comments of AT&T Inc., ET Docket No. 10-123 (Apr. 22, 2011) at 7, *available at* http://apps.fcc.gov/ecfs/document/view?id=7021240827 .
[27] Comments of CTIA – The Wireless Association, ET Docket No. 10-123 (Apr. 22, 2011) at 13, *available at* http://apps.fcc.gov/ecfs/document/view?id=7021240782.
[28] Comments of T-Mobile USA, Inc., ET Docket No. 10-123 (Apr. 22, 2011) at 7, *available at* http://apps.fcc.gov/ecfs/document/view?id=7021240877.
[29] Comments of Motorola Solutions, Inc., ET Docket No. 10-123 (Apr. 22, 2011) at 3; *available at* http://apps.fcc.gov/ecfs/document/view.action?id=7021240876.

additional spectrum available for licensed commercial mobile broadband."[30] Ericsson stated that "[b]ased on the size and location of the exclusion zones, high-powered radars, stringent filtering requirements, and fixed satellite services in the band, the usage of the band 3550-3650 MHz for commercial mobile broadband services on a shared bases does not appear to be supportable."[31]

IV. CONCLUSION

The undersigned member groups of the Public Interest Spectrum Coalition applaud the Commission for moving quickly and creatively to implement the short-term recommendation of the PCAST to open the 3550-3700 MHz bands for opportunistic General Authorized Access. It is increasingly clear that meeting rapidly rising consumer demand for high-bandwidth applications on mobile devices will require not merely more exclusively-licensed spectrum, which is in limited supply, but also policies that facilitate shared, dynamic access to underutilized bands, both federal and privately-licensed. PISC once again urges expedited consideration and implementation of the three-tier framework proposed in this *NPRM*.

Respectfully Submitted,

Open Technology Institute at the New America Foundation
Consumer Federation of America
Public Knowledge
Free Press

/s/ *Michael Calabrese*
Michael Calabrese
Wireless Future Project/Open Technology Institute
New America Foundation
1899 L Street, NW – 4th Floor
Washington, DC 20036

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[30] *Id*. at 3.
[31] Comments of Ericsson, ET Docket No. 10-123 (Apr. 22, 2011) at 27-28; *available at* http://apps.fcc.gov/ecfs/document/view.action?id=7021240892.